Torsiflex-I Coupling

P-5022-TBW

Service & Installation Instructions

TB Wood's® Incorporated

An **Altra Industrial Motion** Company

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It is essential that a competent person carry out all the instructions contained in the following documents. Should any problems be anticipated or encountered then TB Wood's personnel are available for site visits or, alternatively, repairs and overhauls can be undertaken in our facility.

Prior to performing any maintenance work (including inspections) it is essential that the power supply is isolated and that no accidental movement of rotating machinery is possible.

This product is designed for a specific purpose. It is vital that it is not used for any purpose other than that for which it is designed and supplied, and that the limits of it's capacities, as detailed here or in any other document, are not exceeded.

No liability will be accepted and any warranty, either expressed or implied, will be null and void should any component of whatever kind, including nuts, bolts and washers, be used in the assembly, or modifications be made to all or part of the product which are not supplied, specified or agreed by TB Wood's.

The following instructions should be read and understood prior to starting any assembly or maintenance work on the Torsiflex-I disc coupling.

Prior to fitting any component, care should be taken to ensure that it is clean and free from any dirt. When tightening any bolts or screws, this should be done evenly, cylinder head fashion, to 50% torque then to 100% torque in the same sequence. Where specified it is essential that torque-tightening figures are not exceeded nor should it be allowed for them to be below specification.

While installing and removing the transmission unit*, the unit should be supported to ensure that the weight is not imposed on one side only.

Record the TB Wood's order number, coupling type and size and any relevant information for future use.

Contact TB Wood's for repair work and spare components.

Do not use any components that are not supplied or approved by TB Wood's in the assembly of this product.

Do not attempt, where the weight of the unit is excessive, to lift the coupling without the use of lifting equipment.

The inherent balance of these couplings could be disturbed if they are allowed to be knocked either by striking or rolling. Care should be taken when transporting and fitting to avoid such knocks.This is particularly important when a coupling is specifically balanced.

* refer to section 8, figure 3 for definition of Transmission Unit

1.3 Description of Couplings

The Torsiflex-I coupling is of the dry disc type. Flexibility is obtained by the deformation of the disc packs, within defined limits, which are separated by a tubular spacer.

Individual discs are of regular polygonal profiles, which are assembled into a stack of previously designated thickness, supported by washers on each side. Flexibility is accomplished by connecting through the holes, on a common bolt circle diameter, by means of bolts, alternately, to driving and driven components.

The bolts, washers and associated holes are machined to close limits associated with “fitted bolts”. Due to the need for reasonable ease of assembly, interference fits are undesirable and, consequently, tolerances are such as to allow for a close slide or slight transition fit. To compensate for these clearances and to ensure the best possible concentricity between components, the bolt circle diameter of the bolt holes in the flexible element is made smaller than that of the mating holes in the adjacent components. On assembly, all inherent clearances are, therefore, eliminated.

Coupling bolts are sized such that they are capable of inducing a load equivalent to 4 times the tensile load in the flexible element discs, between driving and driven bolt, when transmitting the full rated continuous torque of the coupling. This assumes a coefficient of friction between the various components of 0.25 but experience has shown that, due to the high loads induced, minute compressive deformation is sufficient to raise this to about 0.3.

The reason for adopting this principle of using large, highly loaded, bolts is two-fold a) to prevent interface slip, as already mentioned, and b) to eliminate any chance of bolt bending due to the overhung radial loading imposed by the flexible element. Avoiding either slip or bending helps to avoid fretting which occurs when bolts are designed only to drive in shear.

Pairs of coupling washers are used to “sandwich the disc packs”, one thin, (the element washer), and one thick, (the overload washer). The overload washers locate in close clearance holes in the coupling adaptor plates. In the unlikely event of a severe overload the overload washers will contact the side of the clearance hole, thus preventing failure of the elements and ensuring drive is maintained.

In general, the design is identical to a large number of units supplied and fitted for many years by Turboflex.

1.4 Torsiflex-I Coupling Data

- Specifically designed for the process pump and general industrial markets.
- Plug-in design allows installation and removal without disturbing the hubs
- Standard couplings fully compliant with the requirements of API 610.
- Incorporates anti-flail feature
- Compliance with API 671/ ISO 10441 available
- Large hubs available on first two sizes

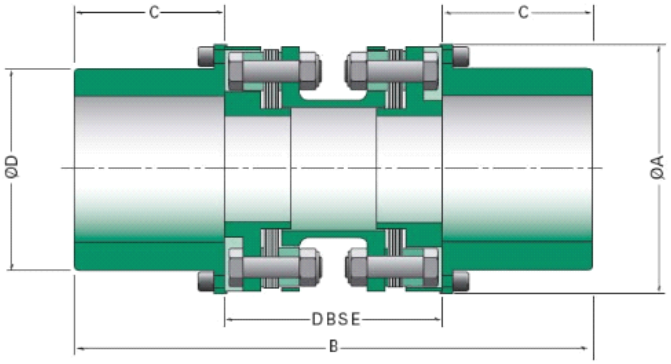


Figure 1

Table 1

Coupling Size	Torque Rating		Max Speed RPM	Coupling Dimensions (in)					Max Bore				Weight Transmission Unit (lb)		Weight Unbored Hub (lb) (2)	
									Square Key		Reduced Key					
	HP / 100 rpm	(lb-in)		A	B	C	D	Min DBSE (1)	Standard Hub (in)	Large Hub (in)	Standard Hub (in / [mm])	Large Hub (in / [mm])	Weight @ Min DBSE	Add Per Inch.	Standard (2)	Large (2)
27	3.79	2,390	20,000	3.35	5.91	1.57	2.362*	2.76	1.75	2.25	1.81 [47]	2.25 [57]	3.0	0.17	2.20	3.80
38	5.34	3,363	16,500	4.21	6.30	1.77	2.992*	2.76	2.25	3.00	2.38 [61]	3.00 [76]	4.3	0.25	4.01	6.75
140	19.7	12,391	12,000	5.00	9.84	2.95	3.98	3.94	2.94		3.19 [81]		10.1	0.39	10.8	–
260	36.5	23,013	10,000	6.06	11.42	3.35	4.76	4.72	3.50		3.75 [97]		17.2	0.57	17.6	–
400	56.2	35,404	8,500	6.93	13.78	4.13	5.67	5.51	4.25		4.5 [117]		28.4	0.80	30.4	–
750	105	66,383	7,500	7.99	16.14	4.72	6.46	6.69	4.63		5.00 [132]		46.7	1.26	46.1	–
1310	184	115,948	6,500	9.49	19.29	5.71	7.76	7.87	5.63		6.13 [162]		80.7	1.49	80.2	–
1900	267	168,169	5,600	10.98	19.69	5.91	9.17	7.87	6.75		7.00 [192]		100	1.84	109	–
2500	351	221,275	5,200	11.65	21.57	6.46	9.45	8.66	6.88		7.13 [197]		132	2.24	133	–
3300	463	292,083	4,900	12.84	23.78	7.17	10.63	9.45	7.63		8.25 [220]		179	2.73	186	–
6000	843	531,060	4,000	15.55	28.35	9.06	12.68	10.24	9.00		9.88 [265]		273	4.10	333	–
8500	1194	752,335	3,600	17.44	33.07	10.24	14.37	12.60	10.63		11.25 [302]		439	5.39	485	–
12000	1685	1,062,120	3,000	19.45	36.38	11.50	16.02	13.39	11.50		12.75 [337]		569	6.64	686	–

* For Large Hub D = A

(1) The inclusion of additional features such as packing rings, shims and/or electrical insulation will increase the minimum DBSE (Distance Between Shaft Ends)

(2) For Finish Bore Hub weight = Weight Unbored hub - .222 * Hub Length * Bore Dia.^2

2 Operating Conditions

In operation the flexible elements are subjected to both tensile and bending stresses, each having an influence on the allowable magnitude of the other. It is important, therefore, that the operating limits of the various deflections for which the coupling is designed to accommodate, are kept, as far as practicable, within those indicated on the “Allowable Misalignment Curve”.

In practice, the initial alignment of the coupling should be as close as possible and within the alignment limits given in the section 8.0 “Installation Instructions”. This will allow for changes during operation to remain within allowable limits.

As the Ameridrives • Bibby units are designed to transmit the torque in friction between the driving and driven bolts and the flexible elements, it is essential that, should the need arise, these bolts should be correctly tightened to the torque indicated on the assembly drawing or in the “Installation and Maintenance Instructions”.

Torque and speed should remain within the originally specified conditions.

3 Product identification/marking for non-electrical equipment.

Scope: Torsiflex-I Disc Coupling Assemblies, excluding component spares.

Equipment manufactured or supplied by Ameridrives • Bibby is marked legibly and indelibly, in a variety of ways, with the following (subject to contractual obligations permitting): -

- Name and telephone number of manufacturer
- Designation of the series or type and size (Part Number)
- Contract/Order Number and if applicable the unique serial number

If applicable, for equipment intended for use in potentially explosive atmospheres, the following will be marked on the equipment in accordance with the ATEX Directive 94/9/EC and EN 13463-1

- Name and address of manufacturer
- Designation of the series or type and size (Part Number)
- Contract/Order Number and if applicable the unique serial number
- CE Mark.
- Year of construction
- Document of Conformity identification to ATEX Directive

The specific marking of explosion protection followed by the symbol of the equipment group and category

- The letter ‘G’ (concerning explosive atmospheres caused by gases, vapors or mists); and/or the letter ‘D’ (concerning explosive atmospheres caused by dust)
- The letter ‘c’ for constructional safety
- The ambient temperature range when different to -328° F to 725° F (–200° C to 400° C)

4 Limitations of product use

Unless otherwise agreed with Ameridrives • Bibby, these products must be selected in accordance with the recommended selection procedure and must only be used within the performance criteria set out below: - The rated torque capacities, which are stated in the product catalogue and/or product arrangement drawing. A continuous temperature range of -4° F (-20° C) to 300° F (149° C) within the permissible operating limits for angular, radial and axial misalignment, section 7.5, Table 4, and standard hardware. High temperature designs available for temperatures up to 536° F (280° C).

5 Product servicing

Although with proper selection and careful installation a long working life and very high degree of operational safety can be expected, we would recommend that for ATEX certified couplings the element assembly, coupling bolts and attachment screws are replaced at 50000 operational hour intervals.

The operation of a damaged coupling in a hazardous area is contrary to ATEX and in doing so becomes an explosive hazard and is wholly the end users responsibility.

6 Maintenance Instructions

General maintenance of the coupling consists of a check of the following during normal machinery maintenance schedules. API617 references this time period as 3 years for compressor applications.

Axial, Angular & Parallel misalignment to ensure that these are still within the acceptable limits and that no major movements have occurred.

All bolts to ensure that they are correctly tightened.

Inspect the flexible elements visually for signs of fatigue cracking local to the washer anchoring points or general signs of fretting corrosion. Slight bowing or “S” like distortion is not detrimental to the operation of the unit. Note that any cracking will begin at the outermost edge of the outside blade. This means that this inspection is still possible without disturbing the element bolting. The element packs should be replaced at the earliest opportunity should cracking / damage be detected.

Ameridrives • Bibby uses self locking nuts. This gives a high level of performance over many reinstallations.

Note: Any requirement for spare parts should be made quoting the original purchasers original purchase order number and the coupling serial number. (This will be etched on the major coupling flanges) and will appear on all documentation.

7 Alignment Instructions

Torsiflex-I will accept substantial amounts of misalignment, the configuration of each individual unit defining the actual acceptable level. The allowable misalignment is shown graphically on a curve section

7.4. This curve shows the maximum permitted level of misalignment for operation and is NOT intended to define set up limits.

7.1 Alignment Method:

Each company has its own method for aligning machinery all of which are well documented in both internal and freely available documents and books. Hence it is not our intention to describe methods for setting machines. Instead, the following gives guidelines for quick checks for alignment suitable after initial installation and for general maintenance checks.

7.2 Axial Alignment

The suggested limits for axial set up distance between the machinery shafts are as shown in Table 2.

Table 2

Sizes	No. of Bolts	Tolerance on DBSE
TFI0027 to TFI1310	6	+ 0.012 in –
TFI1900 to TFI2500	8	+ 0.010 in –

7.3 Parallel / Radial / Angular Alignment;

Having basically aligned the machinery shafts using one of the established techniques, the coupling may be installed as per the instructions. It is then worth performing a check to establish that the overall alignment is correct for the particular coupling. This may be simply performed by one of the following two methods:

Attach a dial indicator securely to the back of one of the coupling flanges, with the needle in contact with the flange face the other side of the flexible element as near the outside periphery as possible. Rotate the machinery & coupling and locate the minimum reading position. At this position, set the dial reading to zero. Rotate the machinery again and record the maximum reading over 360 degrees. Divide this maximum value by the coupling flange diameter to gain a value in in/in, which should be no greater than that shown in Table 3. (This should be repeated at both flexible elements in a spacer coupling).

An alternative method is, where possible, to accurately measure the distance across the flanges that sandwich the flexible element (element gap) to obtain a maximum and minimum value. The difference between these two values should be divided by the flange outside diameter to obtain a value in in/in, which should be no greater than that shown in Table 3. (This should be repeated at both flexible elements in a spacer coupling).

Table 3

Sizes	No. of Bolts	Tolerance Element Gap
TFI0027 to TFI1310	6	+ 0.003 in/in
TFI1900 to TFI2500	8	± 0.002 in/in

NOTE: These values are intended as guides only and, in certain cases, may be exceeded. IF IN DOUBT, CONTACT Ameridrives • Bibby.

7.4 Installation and Operating Misalignment Limits

The following curve shows the general allowable running misalignment limits

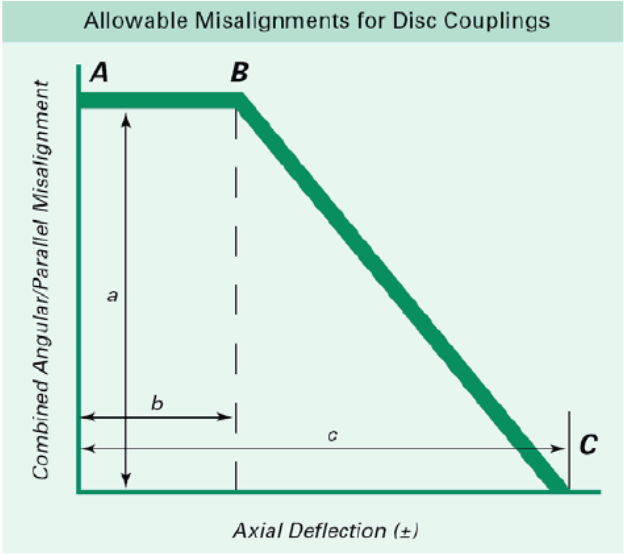


Figure 2

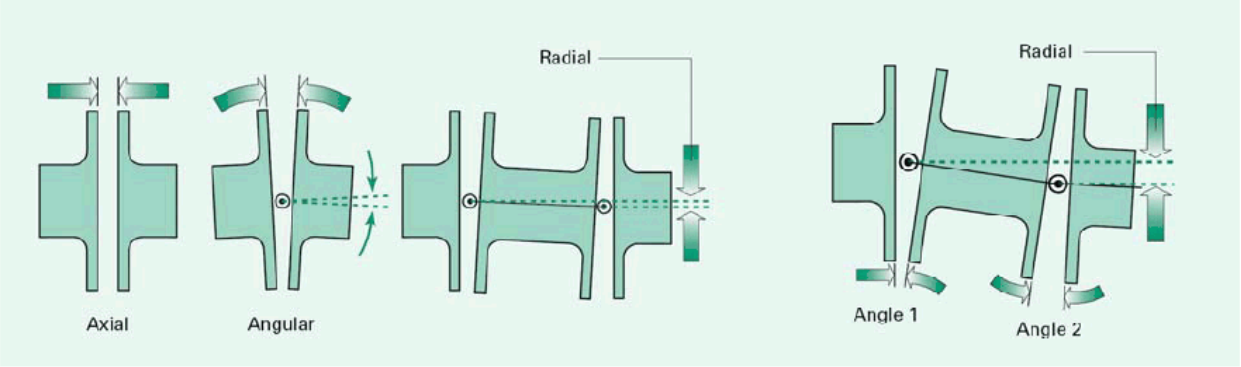
See next page to identify reference points

1. Combined angular/radial misalignment
2. 1 degree angle is equivalent to 0.17 in/in
3. At zero speed (Static)
4. At maximum speed and continuous rated torque

The coupling shall operate within this envelope (below the allowable misalignment curve) and providing these limits are not exceeded at any time, the coupling should enjoy a trouble free life.

Table 4 - TFI Misalignment Data

Coupling Size TFI	Max. Angular Misalignment (Deg.)	Bending Moment (ft.lb./deg.)	Max. Axial Deflection (Zero Angular Misalignment) (in.)	Max. Axial Thrust (lbf.)	Max. Axial Deflection at full Angular Misalignment (in.)	Axial Thrust (lbf.)
	Point A (1) (2)	(4)	Point C (3)		Point B (4)	
	Per Element		Per Assembly			
27	0.5	23	.067	126	.019	15
38	0.5	20	.087	112	.019	9
140	0.5	20	.106	287	.019	20
260	0.5	30	.130	542	.024	28
400	0.5	66	.169	917	.055	112
750	0.5	108	.197	1380	.071	202
1310	0.5	164	.236	1971	.087	292
1900	0.33	277	.197	2473	.059	337
2500	0.33	369	.212	2900	.067	337
3300	0.33	435	.236	3518	.071	405
6000	0.33	704	.295	5170	.094	607
8500	0.33	1025	.319	7531	.110	1124
12000	0.33	1261	.354	8587	.118	1124



7.5 Limited End Float Couplings
N.B. In the case of special limited end float (LEF) versions the amount of axial movement is physically restricted and therefore the values shown in the above table do not apply. In these cases please refer to the coupling drawing for reference to the amount of axial movement the coupling is capable of.

8.0 Installation Instructions
No liability will be accepted, and any warranty, either expressed or implied, will be null and void should any components of whatsoever kind, including nuts, bolts and washers, be used in the assembly or any modifications be made to all or part of the unit which are not supplied, specified or agreed by Ameridrives • Bibby.

For general Safety, Alignment and Maintenance Instructions see other sections of this manual. IMPORTANT: The main Coupling Bolts/Nuts at both ends are tightened by Ameridrives • Bibby, and should, under normal circumstances, NOT BE TOUCHED unless specified in the installation instructions.

When tightening any other bolt or screw, this should be done evenly, i.e. cylinder head fashion, to 50% torque then to 100% torque in the same sequence. Threads should be lubricated with Molybdenum Disulphide grease or equivalent. Reference table 6 for tightening torques.

Check that the parallel & and axial misalignments of the shafts are within the limits defined in the alignment curves, section 7.4, Figure 2. Ameridrives • Bibby do not recommend any specific alignment method as this varies due to personnel preference; however the alignment should be within the operational envelope shown on the misalignment curve.

8.1 Reference any applicable drawings for sizes and dimensions. Ensure that all required tools and equipment are available.

8.2 The coupling is supplied in an assembled state with its misalignment capabilities locked by installation screws near the element packs. The coupling is packed appropriately for transportation and storage. Inspect the coupling for:

- Indication of deviation from specification to ensure that it conforms to requirements.
- Potential damage due to transportation.

8.3 For balanced couplings, note any match markings, which must be aligned when the coupling is installed.

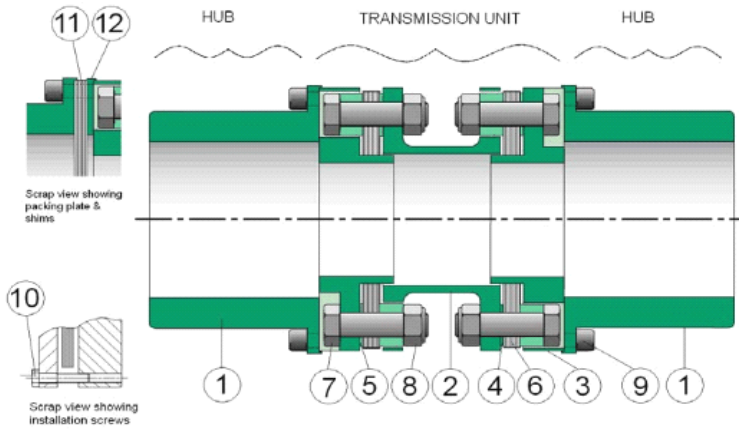


Figure 3: Coupling Construction

Component Parts
1. Hubs
2. Spacer
3. Adaptor
4. Element Washer
5. Element Washers
6. Element Blades
7. Coupling Bolt
8. Coupling Nuts
9. Attachment Screws
10. Installation Screws
11. Shims
12. Packing Plate

8.4 The Torsiflex-I coupling hubs must be removed from the transmissions unit – see figure 3. to allow installation. Remove the connecting nuts and bolts from the hub/adaptor flanges and using jacking screws force the flanges apart. Store the nuts and bolts along with the packing ring and shims (if supplied) for future stages of installation.

8.5 The hubs may now be fitted to the driver and driven shafts. The method of fitting will be dependant on the type of fit specified for the particular installation. In all cases the hub face should be in line with the shaft end.

Where hub/shaft connections require a standard interference fit the hubs may be heated in an oil bath or oven at 392-482° F (200-250° C) and rapidly positioned on the shaft. It is essential that this heat is evenly applied over the whole hub and that spot heating is avoided. Ensure that one shaft rotates so that the coupling match marks can be aligned.

8.6 Check the shafts misalignments and DBSE (distance between shaft ends) are within allowable limits. (Reference Section 7.4).

8.7 The main bolts in the transmission unit are factory assembled and must not be disturbed. Undo the installation screws; the coupling should now be in a relaxed state.

If no packing ring or shims are supplied, go to step 8.12.

8.8 Measure the free length of the transmission unit. Add to this the thickness of the packing plate. Record this value as X.

8.9 Now measure the distance between the shaft ends (DBSE) of the machinery. Adjust this length by either subtracting pre-stretch or adding pre-compression. Record this value as Y

8.10 Calculate the required number of shims from the following equation

Number of shims = (Y-X) ÷ shim thickness

Round this value to a whole number of shims. Shim thickness is 0.015 inches.

8.11 Fit shims between packing ring and the transmission unit. Ensure match marks are aligned.

8.12 Install the installation screws Ref 10, and tighten in cylinder head fashion, maintaining parallelism between the flange faces of the adaptor and spacer, until both elements packs are compressed by a minimum required amount to allow the transmission unit to be put into position. Do not compress the elements beyond the value stated in “Maximum Element Compression” Values. These values express the maximum amount of compression allowed per element pack. However, it is recommended to use the minimum amount of compression required when installing couplings.

Table 5

Coupling Size TFI	Maximum Compressions (in) per element pack
27	0.059
38	0.069
140	0.079
260	0.090
400	0.090
750	0.098
1310	0.118
1900	0.118
2500	0.118
3300	0.118
6000	0.138
8500	0.138
12000	0.157

8.13 Position the transmission unit between the shaft ends (hub faces), ensuring match marks are aligned.

8.14 Fit and tighten in cylinder head fashion the connecting bolts that pass through the packing ring and shims. Reference table 6 for tightening torques.

8.15 Release and remove the installation screws.

8.16 Fit and tighten in cylinder head fashion the attachment screws that pass through the remaining flange. If a pre-stretch is present, it may be necessary to pull the flanges together using the attachment screws. Reference table 6 for tightening torques.

8.17 Ensure all match marks are aligned, all tooling is removed and inspect the coupling before operation.

9.0 Removal Instructions.
Coupling removal is a reverse of the above installation process ensuring that, upon re-installation, the above process is again followed in careful sequence.

Table 6 : When tightening any other bolt or screw, this should be done evenly, i.e. cylinder head fashion, to 50% torque then to 100% torque in the same sequence. Threads should be lubricated with Molybdenum Disulphide grease or equivalent

IMPORTANT: The main Coupling Bolts/Nuts at both ends are tightened by Ameridrives • Bibby, and should, under normal circumstances, NOT BE TOUCHED unless specified in the installation instructions

Table 6

Coupling Size	Disc Pack Bolting		Hub Attachment Screw
	Bolt Stretch	Alternate Bolt Torque	
	(in)	(ft* lb)	(ft* lb)
27	0.0014	7	7
38	0.0014	7	17
140	0.0028	33	7
260	0.0031	55	17
400	0.0031	83	17
750	0.0041	166	32
1310	0.0044	273	53
1900	0.0038	273	53
2500	0.0044	354	133
3300	0.0057	553	133
6000	0.0068	811	258
8500	0.0077	1401	350
12000	0.0091	1844	467

TORSI-LOCK
Shrink Disc
Mounting Instructions

Notes: The shrink rings are supplied assembled and ready to mount. Only the larger units, where the weights involved make handling difficult, should be disassembled to facilitate mounting.

Mounting Instructions

1. Remove any spacers which may have been ar ranged between the pressure rings as protection during transport.

2. The screws should only be tightened to such a degree that the inner ring can still be turned freely.

3. Apply grease to the surface of the hub on which the shrink ring seats.

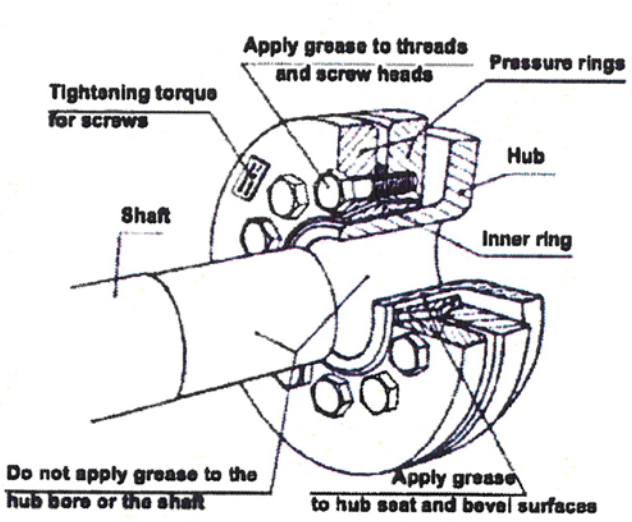
4. Push the shrink ring onto the hub.
   Attention: Do not begin tightening the screws before the shaft is in place in the hub bore, otherwise permanent deformation will result.

5. Push the hub onto the shaft, both contact surfaces beeing ungreased.

6. Make sure the shrink ring is aligned, i.e. the pressure rings are in parallel planes, by tightening the screws with a short wrench.

7. Tighten the ring by tensioning the screws evenly one after the other in a clockwise direction (not in a “crosswise” fashion). It will be necessary to go round several times before all the screws are torqued down to the recommended value. (For torque val ues and required wrench lenghts see table). Check with a torque wrench. The tightening torque is either punched into the material with smaller units, or is indicated on a plate.

Screws (Grade 10.9)	Wrench SIZE (mm)	Tightening Torque	
		Nm	ft.lb
M5	8	5	3.6
M6	10	12	8.7
M8	13	30	22
M10	17	59	44
M12	19	100	74
M16	24	250	185
M20	30	490	362
M24	36	840	620


Apply grease to threads and screw heads
Pressure rings
Tightening torque for screws
Hub
Shaft
Inner ring
Do not apply grease to the hub bore or the shaft
Apply grease to hub seat and beval surfaces

Disassembly

1. Loosen the screws evenly one after the other, again going round several times to avoid canting of the plates on the inner ring.

   Under no cicumstances whatsoever should the screws be totally disengaged, since this could lead to a ring jumping off. (think safety)

2. Before the shaft is dismantled or the hub pulled off, any rust on the hub or shaft should be removed.

3. Remove the shrink ring from the hub.

Cleaning and Regreasing

Shrink rings which have been in service should be totally dismantled and cleaned. The bevel surfaces are factory lubricated with a solid lubricant (e.g. Weicon, “Anti-Seize”).

Undamaged bevel surfaces should be regreased only with “Anti-Seize”, which should likewise be applied to threads and screw-head bearing surface.

Altra Industrial Motion

All Customer Service phone numbers shown in bold

Belted Drives and Sheaves

TB Wood's
Belted Drives
Chambersburg, PA - USA
1-888-829-6637 – Press #5
For application assistance:
1-888-829-6637 – Press #7

Couplings

Ameridrives Couplings
Mill Spindles, Ameriflex, Ameridisc
Erie, PA - USA
1-814-480-5000

Gear Couplings
San Marcos, TX - USA
1-800-458-0887

Ameridrives Power Transmission
Universal Joints, Drive Shafts, Mill Gear Couplings
Green Bay, WI - USA
1-920-593-2444

Bibby Turboflex
Disc, Gear, Grid Couplings, Overload Clutches
Dewsbury, England
+44 (0) 1924 460801
Boksburg, South Africa
+27(0) 11 918 4270

Guardian Couplings
Engineered Flywheel Couplings, Engine Housings and Pump Mounts, Flexible Shaft Couplings
Michigan City, IN - USA
1-219-874-5248

Huco Dynatork
Precision Couplings and Air Motors
Hertford, England
+44 (0) 1992 501900
Chambersburg, PA - USA
1-888-829-6637

Couplings Cont.

Lamiflex Couplings
Flexible Couplings, Bearing Isolators, and Coupling Guards
Cotia, SP - Brasil
+55 (11) 4615-6300

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Elastomeric Couplings
Chambersburg, PA - USA
1-888-829-6637– Press #5
For application assistance:
1-888-829-6637 – Press #7

General Purpose Disc Couplings
San Marcos, TX - USA
1-888-449-9439

Electromagnetic Clutches and Brakes

Inertia Dynamics
Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes
New Hartford, CT - USA
1-800-800-6445

Matrix International
Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes
Brechin, Scotland
+44 (0) 1356 602000
New Hartford, CT - USA
1-800-825-6544

Warner Electric
Electromagnetic Clutches and Brakes
New Hartford, CT - USA
1-800-825-6544
For application assistance:
1-800-825-9050
Saint Barthélémy d'Anjou, France
+33 (0)2 41 21 24 24
Precision Electric Coils and Electromagnetic Clutches and Brakes
Columbia City, IN - USA
1-260-244-6183

Engineered Bearing Assemblies

Kilian Manufacturing
Engineered Bearing Assemblies
Syracuse, NY - USA
1-315-432-0700

Gearing

Bauer Gear Motor
Geared Motors
Esslingen, Germany
+49 (711) 3518-0
Somerset, NJ - USA
1-732-469-8770

Boston Gear
Enclosed and Open Gearing, Electrical and Mechanical P.T. Components
Charlotte, NC - USA
1-800-825-6544
For application assistance:
1-800-816-5608

Nuttall Gear and Delroyd Worm Gear
Worm Gear and Helical Speed Reducers
Niagara Falls, NY - USA
1-716-298-4100

Heavy Duty Clutches and Brakes

Industrial Clutch
Pneumatic and Oil Immersed Clutches and Brakes
Waukesha, WI - USA
1-262-547-3357

Svendborg Brakes
Industrial Brakes and Brake Systems
Vejstrup, Denmark
+45 63 255 255

Twiflex Limited
Caliper Brakes and Thrusters
Wichita Falls, TX - USA
1-844-723-3483
Twickenham, England
+44 (0) 20 8894 1161

Heavy Duty Clutches and Brakes Cont.

Wichita Clutch
Pneumatic Clutches and Brakes
Wichita Falls, TX - USA
1-800-964-3262
Bedford, England
+44 (0) 1234 350311

Linear Products

Warner Linear
Linear Actuators
Belvidere, IL - USA
1-800-825-6544
For application assistance:
1-800-825-9050
Saint Barthélémy d'Anjou, France
+33 (0)2 41 21 24 24

Overrunning Clutches

Formsprag Clutch
Overrunning Clutches and Holdbacks
Warren, MI - USA
1-800-348-0881– Press #1
For application assistance:
1-800-348-0881 – Press #2

Marland Clutch
Roller Ramp and Sprag Type Overrunning Clutches and Backstops
South Beloit, IL - USA
1-800-216-3515

Stieber Clutch
Overrunning Clutches and Holdbacks
Heidelberg, Germany
+49 (0) 6221-30470

For information concerning our sales offices in Asia Pacific check our website www.altramotion.com.cn

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